the contractile vesicle. If effective in *forming*, it could not by any stretch of the imagination be truly regarded as the efficient cause in the almost instantaneous reflux into the mass of the body-substance of the ectosarc constituting the contractile vesicle. Besides, according to Dr. Gruber, the pressure he refers to is exercised at the *posterior* aspect of the *Amœba*, and since the contractile vesicle almost always discharges itself in that region, it would be doing so in the teeth of the very force which is, at the very same time, exerting itself in projecting pseudopodia in the opposite direction to the contractile vesicle.

Having for the present brought these observations to a close, it only remains for me to assure Dr. Gruber that I am extremely glad to find that so able a writer and thinker has been led, although by a different route, to conclusions concerning the relations between endosarc and ectosarc, and the phenomenon of pseudocyclosis, similar to those arrived at by me so many years previously.

BIBLIOGRAPHICAL NOTICES.

Australian Museum. Catalogue of the Australian Hydroid Zoophytes. By W. M. Bale. Sydney: 1884.

The publication of the 'Catalogue of the Australian Hydroid Zoophytes,' printed by order of the Trustees of the Australian Museum, has supplied a want which has long been felt of a detailed and critical account of the various species of Hydroids which have been described from the Australian seas. Many of the older species are known only by very brief descriptions, which, however admirable at the time at which they were framed, have been rendered, more especially in the absence of illustrative figures, altogether indefinite, owing to the numerous allied forms which have since come to light.

The present Catalogue contains, besides the description of a large number of new or lately known forms, redescriptions or amended descriptions of many of these older species in those cases where their identification has been possible, while supplementary characters and original remarks, often with considerable detail, on many of the genera and species which are described give additional value to the work.

A special feature of the Catalogue is the large number of figures which are given, and which, with but few exceptions, are from original drawings.

It will thus be seen that the work is a valuable contribution to the literature on zoophytology, and will form an important landmark in the history of the Australian zoophytes.

For the general student the usefulness of the Catalogue is greatly increased by the succinct account, which is given at the beginning, of the organization of the Hydroida, an account which, as is stated, is mainly drawn from the Rev. Thomas Hincks's 'History of the British Hydroid Zoophytes,' on the plan of which work the present Catalogue is largely modelled. Many interesting facts, based on the author's own observations, are incorporated with this portion of the Catalogue, such, for example, as the occurrence in species of *Sertularia* (*S. crenata*) of an intrathecal ridge, a structure chiefly characteristic of the Aglaophenian section of the Plumularidæ; and the extreme variability in the nature and position of the external apertures in the sarcothecæ of *Aglaophenia*.

Though the introductory *résumé* of the chief features of hydroid organization was by no means intended to be exhaustive, yet it is to be regretted that no mention has been made by Mr. Bale of the neuro-muscular or epidermo-muscular cells in the account of the structure of *Hydra* on the one hand, or of the nervous system of the Medusa-persons on the other.

As regards the distribution of the species, which have hitherto been obtained almost entirely from the eastern part of the continent, two distinct areas exist, one on the north-east, the other on the south-east, in each of which the forms differ almost entirely from each other, though mixing to some extent in the intermediate districts.

Thirty well-marked species occur only in the north-east region, though four of these are found also in districts north of Australia; and eighty species are found only in the south-east region, many of them ranging to Africa, Europe, and America, and occurring more abundantly in New Zealand, with the Hydroid fauna of which that of the south-east region is very closely allied. Two species only, *Idia pristis* and *Plumularia campanula*, occur in both regions. No genera are peculiar to the northern region; but *Lineolaria* with two species, *Halicornopsis*, *Eucopella*, and *Ceratella* with one each, are found only in the southern district, together with that section of *Plumularia* in which only one hydrotheca is borne on each pinna, of which section one of the species, *P. obliqua*, occurs also in England and Tasmania.

A list is given of the principal works in which Australian species have been described, together with a more detailed list of the more important general works on the Hydroida which are quoted or alluded to in the text.

The systematic treatment of the genera and species forms the greater bulk of the volume; and an idea may be formed of the contribution which Mr. Bale has more directly made to the knowledge of the hydroid fauna of the Australian seas, when it is noted that, out of about 125 well-defined species which are recorded, not fewer than 47 have been made known by him.

Counting the undetermined species of *Eudendrium* and *Halecium*, 144 species in all are described, of which about 16 are regarded as doubtful. One species of the genus *Hydra* is recorded, for which the order Eleutheroblastea, following the older classification, has

been retained distinct from the Gymnoblastea. Seven species representing six genera, *Tubularia* with two species, and *Tibiana*, *Eudendrium*, *Pennaria*, *Ceratella*, and *Dehitella* with one each, belong to the Gymnoblastea; while the other species, representing seventeen genera, are forms of the Calyptoblastea, namely:—

Campanularia	12 species.	*Pasythea*	2 species.
Obelia	1 „	*Idia*	1 „
Eucopella	1 „	*Thuiaria*	3 „
Lineolaria	2 „	*Plumularia*	22 „
Lafoëa	1 „	*Antennularia*	2 „
Halecium	1 „	*Aglaophenia*	22 „
Sertularia	40 „	*Halicornaria*	10 „
Diphasia	5 „	*Halicornopsis*	1 „
Sertularella	10 „		

Among the new species which have been described in the Catalogue is one of the singular genus *Lineolaria* (consisting now of two species), which was originally founded by the Rev. Thomas Hincks for a most curious Australian hydroid from Port Phillip, and for which Prof. Allman has since constituted a new family.

In the definition of the genus *Sertularia* Mr. Bale insists on the paired condition of the hydrothecæ as being an essential character which serves as an important distinction between this genus and its allies *Sertularella* and *Thuiaria*; and he points out that the genus *Desmoscyphus*, Allman, is not really distinct from *Sertularia*.

A most remarkable variety of the *Sertularia unguiculata*, Busk, which throws considerable light on the affinities of the genus, is described, in which not only do some pinnæ bear as many as twenty-four pairs of hydrothecæ on the longest internodes, closely adnate throughout the greater part of their length, while towards the end of the pinnæ the ordinary Sertularian type is found, but also on some of the pinnæ there is present a third series of hydrothecæ running for some distance along the front of the first internode.

Very valuable critical remarks are made on the definition of the genus *Thuiaria*. Formerly the adnate condition of the hydrothecæ was a sufficient distinction from *Sertularia*; but this has had to be given up with the increase of our knowledge of their forms, and the distinction was based by Prof. Allman on the nature of the jointing of the hydrocaulus and the number of hydrothecæ on the internode. Mr. Bale points out that this again must be abandoned, and that the real distinction is to be found in the fact, that while in *Sertularia* the hydrothecæ are arranged in pairs, in *Thuiaria* they form two series, those on opposite sides of the hydrocaulus having no special relation to each other.

Correspondingly valuable remarks are made on various points under the genera *Plumularia*, *Aglaophenia*, and *Halicornaria*; but it is to be regretted that the essential characteristics of *Plumularia* and *Antennularia* have not been subjected to the same critical examination which marks many of the other genera.

In this short notice it has been impossible to do full justice to Mr. Bale's admirable work; and the reader must be referred to the work itself for further information.

Elementary Text-Book of Entomology. By W. F. Kirby. London: Sonnenschein and Co., 1885.

The title of this book is somewhat misleading, which was probably not the author's fault, as his object was to furnish "a portable Hand-book, freely illustrated, in which a number of the most typical and remarkable insects of all parts of the world should be popularly described and figured." To this end not less than eighty-seven plates of woodcuts containing 650 figures, of which more than half are devoted to Lepidoptera, are given. Woodcuts are not well adapted for portraying insects; but, on the whole, the species are fairly recognizable, a few, like *Batocera rubus*, *Truxalis nasuta*, *Calepteryx virgo*, and two or three others, excepted. Most of the insects figured are common in collections; and this is an advantage as enabling the beginner to name his species, always a great desideratum.

Mr. Kirby has given short descriptions of most of the families, and often of some of the species, as well as of their habits and economy; considering the necessarily limited character of the work, this has been exceedingly well done.

As to the relationship of the Collembola and Thysanura, we should prefer to follow Sir J. Lubbock, who has made them a special study, and regard them not as "true insects" rather than as Neuroptera. The Mallophaga also would be better placed with the Hemiptera, as Gerstäcker, Claus, and others have placed them. But may we ask why he has invariably commenced the specific names with a capital?

It is, we think, very unfortunate that Mr. Kirby should have reverted to the old name of Locustidæ for the Gryllidæ, and that he should have adopted *Acheta* for the classical *Gryllus*. The former name, a section of the genus *Gryllus* of Linnæus (by whom it was first used, and not by Fabricius), should, by the law of priority, revert to the mole-cricket (*Gryllotalpa*). It is perhaps quite as unfortunate that he, in following the vicious practice of the Munich Catalogue, which pays no attention to names previously used, provided that they are not used for Coleoptera, should have adopted the generic name of the kangaroo for the harlequin beetle that forms his frontispiece.

Mr. Kirby's volume will be very useful to those who only require a general idea of insect-forms; to the traveller, who cannot carry many books with him, it will give a clue to the systematic position of almost any insect he may acquire.

PROCEEDINGS OF LEARNED SOCIETIES.

GEOLOGICAL SOCIETY.

April 29, 1885.—Prof. T. G. Bonney, D.Sc., LL.D., F.R.S., President, in the Chair.

The following communication was read:—

"On the Structure of the Ambulacra of some Fossil Genera and Species of Regular Echinoidea." By Prof. P. Martin Duncan, M.B. (Lond.), F.R.S., V.P. Linn. Soc., F.G.S.

After noticing the general knowledge which exists about the